Remarks

I. Background

As noted on pages 2 and 3 of this latest Office Action on the Merits, applicant had appealed the Examiner's Final Rejection by alleging several errors, one of which was the Examiner's interpretation of the word "adjoining" as meaning "next to." The unreasonableness of that interpretation was evident in the arguments of the Final Rejection, which would seem to allow any two objects to be "adjoining" irrespective of the distance separating those objects and the number and nature of any objects that may be disposed between.

The Examiner now has taken the essentially opposite position on pages 4 and 5 of this latest Office Action, asserting that "adjoining" requires direct contact, based upon a recent Federal Circuit Court decision involving similar but different facts than the current case. Applicant disagrees with the Examiner's latest interpretation as being overly restrictive. For example, the Examiner's latest interpretation excludes reasonable interpretations of "adjoining" that were provided by the Examiner's dictionary definition of adjoining, such as "nearly in contact," "bordering" and "attach(ed) by joining." As another example, the word "adjoining" is commonly used to describe rooms that have a wall separating them (i.e., "adjoining rooms") in which case the rooms are not in direct contact but share a border. Should such rooms have something more than a border or wall between them, such as a stairwell, the rooms would not be said to be "adjoining" but rather could be described as "adjacent rooms." If instead a third room were disposed between the first two rooms, the first two rooms would not be termed "adjacent" or "adjoining."

II. 35 U.S.C. § 102

The Office Action rejects claims 1, 7-10 and 20 under 35 U.S.C. § 102(b) as being anticipated by Japanese Published Application No. 09-035230 to Harada et al. ("Harada"). The Office Action states:

> As per claims 1 and 20, Harada et al. (JP 035230 A) discloses a device for reading or writing information (see FIG. 1 – disk drive), the device comprising: an electromagnetic transducer (magnetic head 1, which

includes electromagnetic transducing element – solid layers of an electromagnetic induction element 11 and magnetoresistive element 12 – see paragraph [0029] of enclosed English machine translation) including a plurality of solid transducer layers of the induction head (11) and/or the layers of the magnetoresistive head (12), a substrate (e.g., slider (2) and unitary integral flexures (3,3)) adjoining said transducer (1), said substrate (1) shaped as a rigid body (slider portion which directly adjoins the transducer (1)) adjacent to said transducer (1) and as a plurality of flexible elements (3) distal to said transducer (1) (e.g., see FIGS. 3, 4 and 5), and an actuator – actuation means as per claim 20 (e.g., portion of load arm between elements (7) which magnetically interacts with (7) to rotationally position the slider (2) to a selected track of the disk (6)) attached (i.e., fastened, or secured or joined to) to said substrate (2 including flexing elements (3)) distal to said transducer (1) (via (4) and/or (5)).

As an initial matter, applicant objects to Harada as being nonenabled. To invalidate a claim for anticipation or obviousness, a prior art reference must be enabling. "That prior art patents may have described failed attempts or attempts that used different elements is not enough. The prior art must be enabling. *See Motorola, Inc. v. Interdigital Tech. Corp.*, 121 F.3d 1461, 1471, 43 USPQ 2d 1481, 1489 (Fed. Cir. 1997) ("In order to render a claimed apparatus or method obvious, the prior art must enable one skilled in the art to make and use the apparatus or method." (*quoting Beckman Instruments, Inc. v. LKB Produkter AB*, 892 F.2d 1547, 1551, 13 USPQ 2d 1301, 1304 (Fed. Cir. 1989)))." *Rockwell Int'l Corp. v. United States*, 147 F.3d 1358, 1365 (Fed. Cir.1998). See also *Fromson v. Advance Offset Plate, Inc.*, 755 F.2d 1549, 1558 (Fed. Cir. 1985), which states: "The 'failed' experiment reported in the prosecution history of the Mason patent renders that patent irrelevant as a prior art reference. As stated by Judge Learned Hand, 'another's experiment, imperfect and never perfected will not serve either as an anticipation or as part of the prior art, for it has not served to enrich it.' *Picard v. United Aircraft Corp.*, 128 F.2d 632, 635 (2d Cir. 1942), *cert. denied*, 317 U.S. 651, 87 L. Ed. 524, 63 S. Ct. 46, (1942)."

Harada notes that: "This document has been translated by computer. So the translation may not reflect the original precisely." More to the point, the "English machine translation" of Harada is in many places impossible to understand and/or absurd. Whether this is due to poor translation or deficiencies and contradictions in the original document is unclear. What is clear, however, is that Harada's description and drawings

would not enable one of ordinary skill in the art to make and use the invention claimed by Harada, and would be further removed from enabling one of such skill to make and use the claims at issue.

For example, Harada states in paragraphs [0020] and [0028], respectively, that "said junction " and "electrical wiring 4" "defecates the front face of the field joined by the inactive atom or ion beam etching in a vacuum or a clarification ambient atmosphere chamber." Harada further states in paragraph [0021] "an erector with a gimbal can install the minute magnetic head and the minute slider section at the tip of a magnetic-head support means more nearly nothing." Similarly, paragraphs [0014] – [0018] of Harada each state: "the magnetic head of the shape of a thin film installed so that it might become abbreviation parallel to a magnetic-recording medium, The pneumatic bearing formed as supported said magnetic head and projected toward the magnetic-recording medium (slider), The electric wiring which outputs and inputs an electrical signal to the magnetic head, It has the magnetic-head slider, the electric wiring, and the arm unification magnetic-head support means which really formed the metal supporter material (arm) which determines the relative position to the magnetic-recording medium of the magnetic head, and constituted it from a single crystal silicon substrate of the same material." Although Harada abounds with further examples of curious or absurd statements, suffice it to say that nearly every paragraph if not every sentence of that reference contains statements whose meaning would have been unclear to one of ordinary skill in the art.

Moreover, much of that which is discernable from Harada is self contradictory. For example, Harada teaches in paragraph [0031] of "..contact hole 21 punched by penetrating a slider 2 from there..." One would expect that "contact hole 21" could not be punched with head 1 attached. Yet Harada does not indicate how to make thin film "magnetic head 1," which according to paragraph [0029], "the dimension of the thickness direction was expanded and exaggerated" in drawing 3, or how to join those delicate thin films to "slider 2." For example, Harada does not disclose what adhesive would be used for that joining, and how could that adhesive allow electrical conduction between "contact hole 21" and "electrode terminal 13" without also providing electrical conduction between all four of the leads ("Electric wiring 4") shown in drawing 4. If

instead heat and/or an applied electric field were to be used to join the "magnetic head 1" to "slider 2," one of ordinary skill in the art would expect that the thin films of the head would be destroyed.

Other contradictions of Harada are also facially evident. For instance, in paragraph [0025] Harada states: "A magnetic-head support device consists of the gimbal 3, the electric wiring 4, and the arm 5 for holding the magnetic head 1, a slider 2, and its posture, and from the magnetic head 1 to the electric wiring 4 is fabricated by the solid configuration with a micro processing technique from a silicon single crystal substrate. On the other hand, in order for appearance processing of the arm 5 to be carried out by photoetching processing which used the metal and to raise flexural rigidity, a part of side edge section to a longitudinal direction is fabricated by bending." How is it possible that "from the magnetic head 1 to the electric wiring 4 is fabricated by the solid configuration with a micro processing technique from a silicon single crystal substrate"? Moreover, it is not possible to reconcile drawing 2 with drawings 4 and 5, although each is said by Harada to represent the same "1st example." For example, the "sectional view" of drawing 2 shows "gimbal 3" connected to "slider 2," yet the "perspective view" of the same example in drawings 4 and 5 instead shows a space between "gimbal 3" and "slider 2," for any lengthwise cross-section that intersects "head 1." For at least these reasons Harada is nonenabled and cannot be used as prior art.

In addition, applicant respectfully disagrees with the Office Action statement that "paragraph [0029]" of Harada discloses "a plurality of solid transducer layers of the induction head (11) and/or the layers of the magnetoresistive head (12)." Paragraph [0029] of Harada does not describe plural layers of the magnetoresistive head (12), but rather describes drawing 3, which does not depict magnetoresistive head (12) at all.

Applicant further respectfully disagrees with the Office Action statement that Harada discloses "an actuator... attached (i.e., fastened, or secured or joined to) to said substrate ... (via (4) and/or (5))." Drawings 3, 4 and 5 do not show an actuator. In drawings 1 and 2, "arm 5" of Harada does not extend to connect with "actuator 7." Even if, *assuming arguendo*, "arm 5" did extend to connect with "actuator 7," it is clear that "arm 5" is not connected with "substrate 2." Moreover, should "electric wiring 4" extend to connect with "actuator 7," as asserted in the Office Action, signal errors would be

expected due to the changing voltage, current and magnetic field in the actuator. Such a debilitating signal error provides yet another reason why Harada is nonenabled. In short, Harada does not disclose that "actuator 7" is attached to "substrate 2" as proposed by the Office Action.

III. 35 U.S.C. § 103

The Office Action rejects claims 2-4, 11-14, 17 and 19 under 35 U.S.C. § 103(a) as being unpatentable over Harada in view of IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No 36, Iss. No. 2, pp. 379-380, published February 1, 1993 ("IBM TDB"). The Office Action states:

> With regard to claims 2-4, 11 and 12, Harada et al. (JP 9-035230) remains silent with respect to the aforementioned actuator including a layer or layers of piezoelectric material (i.e., an electrorestrictive actuator as per claim 11).
>
> Such piezoelectric layers (as well as actuators used in the type of disk drive disclosed in Harada et al. (JP 9-035230)) are well known in the art, however.
>
> As just one example, IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No 36, Iss. No. 2, pp. 379-380, published February 1, 1993 (referred to hereinafter as IBM TDB), discloses a rotary type actuator used in an analogous type of disk drive as that of Harada et al. (JP 9-035230), wherein the corresponding actuator used within the IBM TDB includes a piezoelectric layer/layers (i.e., an electrorestrictive actuator) formed as part of a piezoelectric actuator, in lieu of the conventional type rotary actuator. The IBM TDB uses such a piezoelectric actuator in lieu of the conventional type rotary actuator in order to, *inter alia*, reduce access time, provide high shock resistance and reduce volume. See the last paragraph of page 1 of the IBM TDB.
>
> Additionally, as per claim 19, wherein the actuator of the IBM TDB includes means ("certain voltage applied to the piezo(s)" – see description of the IBM TDB), for providing electrical voltage to said piezoelectric i.e., electrorestrictive) actuator.
>
> It would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the piezoelectric actuator of the type disclosed by the IBM TDB, in lieu of the conventional actuator disclosed by Harada et al. (JP 9-035230).
>
> The rationale is as follows: one of ordinary skill in the art at the time of the invention was made would have been motivated to provide the piezoelectric actuator of the type disclosed by the IBM TDB, in lieu of the conventional actuator disclosed by Harada et al. (JP 9-035230) in order to,

inter alia, reduce access time, provide high shock resistance and reduce volume. See the last paragraph of page 1 of the IBM TDB.

Like Harada, the IBM TDB cited by the Office Action is nonenabled, albeit for different reasons. One problem with the IBM TDB is the requirement that, in order to expand and create torque as described in that disclosure, piezo A and the arms and other structure surrounding piezo A must be free to move, with only the pivot fixed. Therefore, there is nothing to prevent piezo A and the arms and other structure surrounding piezo A from rotating, instead of rotating the suspension. A similar reasoning can be applied to piezo B and its surrounding structure. Thus, one of ordinary skill in the art would expect the IBM TDB to provide some unknown and unpredictable amount of actuation to the head, destroying the actuator's essential purpose of accessing specific tracks on the medium.

Note further that the "long stroke" actuation of IBM TDB is achieved by mechanical multiplication of the piezoelectric movement by a factor of one thousand. Stated differently, any error or inaccuracy in the long stroke actuator of the IBM TDB is multiplied by a factor of one thousand at the head, likely leading to intolerable errors. Even so, this long stroke actuation only achieves a maximum range of one centimeter, requiring at least two such long stroke actuators (along with additional actuators, suspensions and heads) for even the small disk surface shown. Note that even the "fine movement" actuation would multiply errors by a factor of twenty, and that both of these factors would multiply the unpredictable actuation discussed above.

Moreover, it is unclear how the limited long stroke actuation described in the IBM TDB would even allow the disk drive depicted in that disclosure to be fabricated. For example, while it may be possible for the head and suspension designed for interaction with the outer zone of the disk to be moved beyond the circumference of the disk to allow drive fabrication, this would presumably require even greater mechanical multiplication and greater errors. On the other hand, it is not at all clear how the head and suspension designed for interaction with the inner zone of the disk could be moved beyond the circumference of the disk during fabrication, as this would seem to require more than double the admittedly limited range of actuation provided.

In addition, the IBM TDB does not disclose, and it would not have been evident to one of ordinary skill in the art, how to write on and read from the other major surface of the disk of that disclosure. Note that at least an additional pair of heads and suspensions would be needed for this essential feature of a modern disk drive, and each head and suspension would require an additional pair of actuators. Cramming the additional actuators on the same side of the disk as the actuators that are shown would seem to interfere with the additional heads and suspensions that would need to be located on that side of the disk. Reducing the size of the actuators in order to avoid such interference is contradicted by the meager large stroke motion provided by the actuators shown, which require mechanical multiplication of one thousand times in order to provide movement that, as discussed above, is still inadequate. In addition, attempts to reduce the actuator size would require greater mechanical multiplication and create even more errors.

Attempting to provide additional actuators on the opposite side of the disk from the actuators shown would exacerbate these difficulties. Placing the actuators in the corners directly across from the actuators shown would destroy the ability of all the original heads and suspensions as well as all the additional heads and suspensions to function, as the suspensions on each side would need to be in the same place as the actuators on the other side. On the other hand, placing the actuators in the corners across and ninety degrees from the actuators shown would destroy the functioning of both the original heads and suspensions designed for accessing the outer zone and the additional heads and suspensions designed for accessing the outer zone, as the outer heads and suspensions on each side would need to be in the same place as the actuators on the other side.

In addition, the inability of the head and suspension designed for interaction with the inner zone of the disk to be moved beyond the circumference of the disk during fabrication, as mentioned above, would make fabrication intractable should such an inner zone head and suspension be required for the other surface of the disk.

For at least the above reasons, the IBM TDB is nonenabled and is therefore not prior art that can be used in an obviousness rejection.

Furthermore, *assuming arguendo* that the IBM TDB is somehow enabled, one of ordinary skill in the art would not have been motivated to provide the actuator of the IBM TDB in lieu of the conventional actuator of Harada due to the many problems the IBM TDB, as discussed above. In addition, even the attributes alleged by the IBM TDB would not have been believed by one of ordinary skill in the art. For example, the reduced volume allegedly offered by the IBM TDB is contradicted by the discussion above that points out that the IBM TDB does not provide the possibility of storage on both sides of the disk, and so the IBM TDB requires an additional drive for the same amount of storage, increasing rather than reducing the volume. Similarly, the arms shown in Fig. 1 of the IBM TDB would need to be thin and therefore fragile to provide even the minimal actuation alleged at the low voltage levels of a disk drive, and the bending of those arms to allow for that minimal actuation would weaken the arms over time, decreasing rather than increasing shock resistance.

Moreover, the combination of large errors despite limited actuation would have dissuaded one of ordinary skill in the art from employing the IBM TDB in a disk drive, which is perhaps the reason the IBM TDB was apparently never fabricated, used or even considered worthy of a patent application. As noted in *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992): "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." Of course, due to the many problems of Harada, some of which are discussed above, one of ordinary skill would not have looked to Harada in the first place.

With regard to claims 3 and 13, the Office Action states:

> Moreover still, as per claims 3 and 13, the resulting combination of the piezoelectric actuator as taught and explicitly suggested by the IBM TDB, as applied to Harada et al. (JP 9-035230), would provide horizontally disposed piezoelectric layers as depicted in the FIGS. of the IBM TDB which would be "substantially parallel" with the horizontal layers of the transducer (e.g., the upper and lower core layers (112) which constitute part of the induction head - see FIG. 3 of Harada et al. (JP 9-035230).

As noted above, neither Harada nor the IBM TDB are enabled, and both Harada and the IBM TDB provide disincentives that would have dissuaded one of ordinary skill

in the art from making the combination proposed by the Office Action. As such, the piezoelectric layers of the IBM TDB would not be "substantially parallel" with the horizontal layers of the transducer of Harada, because the two would not have been combined in one device.

With regard to claim 6, the Office Action states:

> Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230) in view of Endo (JP 06-176517 A).
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> See the discussion of Harada et al. (JP 9-035230), *supra*.
>
> With regard to claim 6, Harada et al. (JP 9-035230) does not explicitly show wherein said flexible elements are substantially aligned with a center of mass of said rigid body (i.e., the slider).
>
> Endo (JP 06-176517 A), however, disclose wherein a support suspension portion of the flexure end of a suspension is absorbed into a slider (i.e., rigid body), in order to, inter alia, shorten the distance against the surface of the magnetic disk (i.e., by reducing the Z-height) and to further provide stable support of the slider by positioning such flexure(s) adjacent the center of mass of the rigid body.
>
> It would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the teaching of a suspension end flexure support provided as being substantially aligned with a center of mass of the rigid body of Harada et al. (JP 9-035230), as explicitly taught and suggested by Endo (JP 06-176517 A)..
>
> The rationale is as follows: one of ordinary skill in the art at the time of the invention was made would have been motivated to provide the teaching of a suspension end flexure support provided as being substantially aligned with a center of mass of the rigid body of Harada et al. (JP 9-035230), as explicitly taught and suggested by Endo (JP 06-176517 A) in order to, shorten the distance against the surface of the magnetic disk (i.e., by reducing the Z-height) and to further provide stable support of the slider by positioning such flexure(s) adjacent the center of mass of the rigid body.

Applicant respectfully disagrees with the Office Action assertion that 'it would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the teaching of a suspension end flexure support provided as being substantially aligned with a center of mass of the rigid body of Harada, as explicitly taught and suggested by Endo (JP 06-176517 A; "Endo").' Initially note that the Office Action does not even assert a case of obviousness of claim 6, instead alleging that it "would have been obvious ... to provide the teaching of..." Perhaps this is because Endo involves a suspension that is fitted into a groove of the slider whereas Harada claims to

have gimbals that are located to the side of the slider, there is no evident way to reconcile these opposite approaches. As mentioned above, the Office Action provides no suggestion as to how providing the teaching of Endo would accomplish the device defined in claim 6.

With regard to claim 18, the Office Action states:

> Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (JP 9-035230) and IBM Technical Disclosure Bulletin entitled "Piezoelectric Actuator for Small Hard Disk Drive," Vol. No 36, Iss. No. 2, pp. 379-380, published February 1, 1993, as applied to claim 11 above, and further in view of Fukuoka (JP 09-148639 A).
>
> ...

As discussed above, both Harada and the IBM TDB are nonenabled and provide disincentives rather than motivation to make the combination proposed in the Office Action. Fukuoka (JP 09-148639 A; "Fukuoka") teaches prevention of deformation of an inner electrode layer by adding silicon nitride. The IBM TDB, however, does not teach where an electrode is to be located, and so it is not clear that deformation of an electrode would be a problem. Instead, because the IBM TDB requires deformation of piezo A and the arms and other structure surrounding piezo A, one of ordinary skill in the art would not have modified the proposedly combined Harada and the IBM TDB with Fukuoka as proposed by the Office Action.

IV. New Claims

New claims 21-29 are being presented herewith. Because six more dependent claims are being presented than that previously paid for, an Excess Claims Fee of $150.00 is enclosed.

V. Petition to Extend Time

A Petition to Extend the Time for Response by one month, from April 11, 2005 to May 11, 2005, is enclosed, along with the requisite fee of $60.00.

VI. Check Enclosed

A check in the amount of $210.00 is enclosed, to pay for the Excess Claims Fee of $150.00 and the Petition to Extend the Time for Response Fee of $60.00.

VII. Conclusion

Applicant has responded to each of the items of the Office Action, showing that the Office Action has not presented a prima facie case of anticipation or obviousness for any of the claims. As such, applicant respectfully asserts that the application is in condition for allowance, and a notice of allowance is solicited.

Respectfully submitted,

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on May 11, 2005.

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